

MET35 --- ELECTRICAL AND ELECTRONICS ENGINEERING

OBJECTIVES

- To understand the construction and operation of Transformers.
- To understand the construction and operation of Induction machines.
- To understand the construction and operation of Alternators.
- To acquire knowledge about operational amplifiers and its applications.
- To acquire knowledge about 555 IC and its applications

UNIT – I: Transformers

EMF Equation – Equivalent circuit – Voltage regulation - OC and SC Test – Efficiency- Condition for maximum efficiency – All day efficiency – Autotransformer –Introduction to three phase Transformer.

UNIT – II: AC Machines

Theory and operation of 3 phase Induction motor - constructional details – starting methods – speed control methods – principle of operation of single phase Induction motor – stepper motor – AC series motor – Applications.

UNIT – III: Alternators

Alternators - construction - Operating principle - alternators on No load – Alternators on Load - Phasor diagram - Losses – Efficiency-voltage regulation by EMF method –Parallel operation of alternators.

UNIT – IV: Electronics

Op. Amp. – Characteristics – Inverting amplifier - Non-inverting amplifier - differentiation integration I/V converter - V/I converter - Instrumentation amplifier –adder – subtractor – First order low pass filter and High pass filter using op. Amp.

UNIT – V

Advantages of ICs - pin configurations of 555 IC - Design of Astable and mono-stable multi-vibrator using 555 IC - design of counters using FF-UP/DOWN counters– -Ring counters - Multiplexes –De multiplexes.

Text Books:

1. I. J. Nagrath & D. P. Kothari, Electric Machines, IV Edition, Tata Mc. Graw-Hill Education, New Delhi, 2010
2. Ramakant A Gayakward, Operational Amplifiers and Linear Integrated circuits, 4th Edition, PHI Learning, Delhi, 2009.

Reference Books:

1. Albert Malvino and David Bates, “Electronic Principles”, 7th Edition, Tata Mc. Graw Hill, New Delhi, 2006.
2. B. L. Theraja & A. K. Theraja, A Textbook of Electrical Technology: AC and DC Machines, Volume - II, 23rd Edition, S. Chand & Company, New Delhi, 2012.